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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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WAGNER, MURABITO & HAO LLP
TWO NORTH MARKET STREET
THIRD FLOOR
SAN JOSE, CA 95113

EXAMINER

ESTRADA, MICHELLE

ART UNIT	PAPER NUMBER
2823	

DATE MAILED: 05/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/805,273

Applicant(s)

YANG, WENG

Examiner

Michelle Estrada

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-20 and 27-55 is/are pending in the application.
- 4a) Of the above claim(s) 17-20 and 27-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 35-55 is/are rejected.
- 7) ☒ Claim(s) 35-55 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/8/04 has been entered.

Claim Objections

Claims 35-55 are objected to because of the following informalities: the term "highly" is a relative term. If applicant intends any particular material, it should be clearly recited. Appropriate correction is required.

In claim 35, line 6, it appears that "where" should be replaced with --wherein--.

In claim 47, line 2 it appears that "o" should be replaced with --to--.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 35 and 38-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Yoshigai et al. (6,191,045) and Kugimiya et al. (6,277,763).

With respect to claim 35, Yoshigai et al. disclose depositing a conductive adhesive layer (204) upon a substrate (205); depositing a highly conductive layer (202) upon said conductive adhesive layer; etching a portion of said highly conductive layer (202) and a portion of said conductive adhesive layer utilizing a plasma, wherein said plasma comprises an etchant, wherein said etchant comprises chlorine and oxygen (Col. 3, lines 60-65); conductive layer is adhered to said substrate by an adhesive layer (204);

With respect to claim 38, Yoshigai et al. disclose wherein said conductive adhesive layer comprises polysilicon, and said highly conductive layer comprises tungsten (Col. 3, lines 35-37).

Yoshigai et al. do not disclose wherein said plasma is ionized and sustained by a first RF source, and wherein said plasma is accelerated by a second RF source.

With respect to claim 35, Kugimiya et al. disclose wherein said plasma is ionized and sustained by a first RF source, and wherein said plasma is accelerated by a second RF source (Col. 5, lines 10-15).

With respect to claim 42, Kugimiya et al. disclose wherein said first RF source is approximately 100 to about 1000 watts, this range overlaps with the range recited in claim 42, which is about 800 to 1500 watts.

With respect to claim 43, Kugimiya et al. disclose wherein said second RF source is approximately 10 to about 300 watts, this range overlaps with the range recited in claim 43, which is about 50 to 150 watts.

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Yoshigai et al. and Kugimiya et al. to enable the plasma step of Yoshigai et al. to be performed according to the teachings of Kugimiya et al. because one of ordinary skill in the art would have been motivated to look to alternative suitable methods of performing the disclosed plasma step of Yoshigai et al. and art recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07.

With respect to claims 39-41, Choice of a particular pressure, flow rates of chlorine gas and oxygen gas and plasma RF source power would have been a matter of routine optimization. See MPEP 2144.05. The combination of Yoshigai et al. and Kugimiya et al. discloses the claimed invention except for the particular pressure range and flow rates of chlorine gas and oxygen gas. It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the recited pressure range and flow rates of chlorine and oxygen, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

In addition, the selection of pressure, flow rates of chlorine gas and oxygen gas and plasma RF source power, it's obvious because it is a matter of determining optimum process conditions by routine experimentation with a limited number of species

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of result effective variables. These claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996)(claimed ranges or a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill or art) and In re Aller, 105 USPQ 233 (CCPA 1995) (selection of optimum ranges within prior art general conditions is obvious).

Claims 36, 37 and 44-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Yoshigai et al. and Kugimiya et al. as applied to claims 35 and 38-43 above, and further in view of Mui et al. (6,037,265).

The combination of Yoshigai et al. and Kugimiya et al. does not disclose wherein said first conductive adhesive layer has a thickness of approximately 10 to 500 angstroms; wherein said highly conductive layer and said conductive adhesive layer have a combined thickness of approximately 3000 angstroms or less; selectively etching a portion of said highly conductive layer and a portion of said conductive adhesive layer.

With respect to claim 36, Mui et al. disclose wherein said conductive adhesive layer (16) has a thickness typically from 300 Å to about 8000 Å, the thickness of (16)

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would depend upon the end use of the semiconductor, which is to contain layer (16) (Col. 6, lines 6-10). Mui et al. disclose a thickness range that overlaps the thickness range recited in claim 36.

With respect to claim 37, Mui et al. disclose wherein said highly conductive layer and said adhesive layer etching have a combined thickness of at most 3000 Å approximately 3000 angstroms or less, this would depend on the thickness chosen for the polysilicon layer and the conductive layer.

With respect to claim 44, Mui et al. disclose selectively etching a portion of said highly conductive layer (22) and a portion of said conductive adhesive layer (16) utilizing a plasma.

With respect to claim 48, Kugimiya et al. disclose wherein said first RF source is approximately 100 to about 1000 watts, this range overlaps with the range recited in claim 42, which is about 800 to 1500 watts.

With respect to claim 49, Kugimiya et al. disclose wherein said second RF source is approximately 10 to about 300 watts, this range overlaps with the range recited in claim 43, which is about 50 to 150 watts.

With respect to claim 50, Yoshigai et al. disclose wherein the substrate comprises silicon oxide (205) (Col. 3, lines 60-65); said conductive adhesive layer comprises polysilicon; and said highly conductive layer comprises tungsten (Col.3, lines 50-55).

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With respect to claim 52, Kugimiya et al. disclose plasma etching a tungsten layer (414) and an adhesive layer (420) using a Decoupled Plasma Source System (Col. 2, lines 57-61).

With respect to claim 55, Kugimiya et al. disclose wherein said first RF source is approximately 100 to about 1000 watts, this range overlaps with the range recited in claim 42, which is about 800 to 1500 watts; and wherein said second RF source is approximately 10 to about 300 watts, this range overlaps with the range recited in claim 43, which is about 50 to 150 watts (Col. 5, lines 10-15).

It would have been within the scope of one of ordinary skill in the art to combine the teachings Yoshigai et al., Kugimiya et al. and Mui et al. to enable the etching step of the combination of Yoshigai et al. and Kugimiya et al. to be performed according to the teachings of Mui et al. because one of ordinary skill in the art would have been motivated to look to alternative suitable methods of performing the disclosed etching step of the combination of Yoshigai et al. and Kugimiya et al. and art recognized suitability for an intended purpose has been recognized to be motivation to combine. See MPEP 2144.07.

With respect to claims 45-47, 51, 53 and 54, Choice of a particular pressure, flow rates of chlorine gas and oxygen gas and thickness of the conductive adhesive layer and highly conductive layer would have been a matter of routine optimization. See MPEP 2144.05. The combination of Yoshigai et al., Kugimiya et al. and Mui et al. discloses the claimed invention except for the particular pressure, flow rates of chlorine gas and oxygen gas and thickness of the conductive adhesive layer and highly

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conductive layer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the recited pressure, flow rates of chlorine gas and oxygen gas and thickness of the conductive adhesive layer and highly conductive layer, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.


In addition, the selection of pressure, flow rates of chlorine gas and oxygen gas and thickness of the conductive adhesive layer and highly conductive layer, it's obvious because it is a matter of determining optimum process conditions by routine experimentation with a limited number of species of result effective variables. These claims are prima facie obvious without showing that the claimed ranges achieve unexpected results relative to the prior art range. *In re Woodruff*, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also *In re Huang*, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996)(claimed ranges or a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also *In re Boesch*, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill or art) and *In re Aller*, 105 USPQ 233 (CCPA 1995) (selection of optimum ranges within prior art general conditions is obvious).


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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Estrada whose telephone number is 571-272-1858. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2800.


MEstrada
May 25, 2004


George Fourson
Primary Examiner
Art Unit 2823